

WHAT IS CLAIMED IS:

1. Branched and coupled polymers based on conjugated dienes or on
conjugated dienes and vinylaromatic compounds and on polyfunctional,
5 organic compounds having at least 4 groups which are capable of
coupling, wherein the polymers have a molecular weight ratio (M_w/M_n) of
1.0 to 3.0, a weight-average molecular weight (M_w) of 400,000 to
2,000,000, a glass transition temperature (T_G) of -50 to -10°C, an amount
of 1,2-vinyl groups of 40 to 80%, based on the diene units present in the
10 polymer, and a degree of coupling of at least 45%, at least 60% of the
coupled polymers having a degree of branching of greater than two, with
the proviso that the amount by weight of polymers with 4- and more than
4-fold branching, based on 100 g of polymer, is always greater than the
amount by weight of polymers with 3-fold branching, and wherein the
15 difference in the solution viscosity of the polymers before and after the
coupling is in the range from 100 to 400 (measured with a solution of 0.5 g
polymer in 100 ml toluene, determined at 25°C with an Ubbelohde
viscometer).
- 20 2. Branched and coupled polymers according to Claim 1, wherein the
molecular weight ratio (M_w/M_n) is 1.5 to 2.8, the weight-average
molecular weight (M_w) is 600,000 to 1,400,000, the glass transition
temperature (T_G) is -40 to -15°C, the amount of 1,2-vinyl groups is 50 to
70% and the degree of coupling is 48 to 80%, and furthermore 70 to 95%
25 of the coupled polymers have a degree of branching of greater than two,
the difference in the solution viscosity before and after the coupling is 140
to 300 and the amount by weight of polymers with 4- and more than 4-fold
branching is 10-50% greater than the amount of polymers with 3-fold
branching.

3. Process for the preparation of the polymers according to Claim 1,
comprising the steps of polymerizing conjugated dienes or conjugated
dienes with vinylaromatic compounds in the presence of inert organic
solvents and in the presence of organic alkali metal compounds, reacting
5 the alkali metal-terminated polymer anions formed with organic,
polyfunctional compounds which have at least 4 groups which are capable
of coupling, wherein the molar ratio of polyfunctional compounds
employed to alkali metal-terminated polymer anions is 0.1 to 0.28:1.
- 10 4. A tire comprising a polymer according to Claim 1.